

ORIGINAL ARTICLE

One new genus and three new species of wingless grasshoppers from Xizang, China (Orthoptera: Acridoidea)

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Abstract One new genus and three new species of wingless grasshoppers, i.e. *Pseudozubovskia* **gen. nov.**, *Pseudozubovskia xizangensis* **sp. nov.**, *Eokingdonella gongbugyanda* **sp. nov.**, *Dysanema magna* **sp. nov.** are described. The type specimens are deposited in the Institute of Zoology, Shaanxi Normal University.

Key words Orthoptera, Acridoidea, wingless grasshopper, new genus, new species.

Wingless grasshoppers mainly contain in the genera of Conophyminae in Catantopidae and the genera *Dysanema* and *Stristernum* of Dysaneminae in Arcypteridae. They are distributed in limited range at high altitude regions, without wings but good at jumping.

One new genus and two new species of Catantopidae, and one new species of Arcypteridae were found during diagnosis of grasshopper specimens collected from Xizang. They are described as follows. The type specimens are deposited in the Institute of Zoology, Shaanxi Normal University.

Pseudozubovskia **gen. nov.**

Body medium size. Head shorter than pronotum. Fastigium of vertex oblique forward, protruding, frontal margin complete, frontal ridge with longitudinal furrow, without fastigial foveolae; antennae filiform; eyes ovate; pronotum cylindrical, posterior margin complete; median carina slender, severed by three transverse furrows, posterior transverse furrow located in the postmedian of pronotum, length of prozona greater than metazona; prosternal spine elongated conical, apex sharp; mesosternal lobes almost square, lateral lobes of metasternum divided; upper margin of median carina of hind femur smooth, without fine denticulate, top of lower kneelobe rounded; hind tibia without outer apical spine; tympanum small; tergum of last abdominal segment of male with small furculae; cercus of male almost columnar; apex of ovipositor sharp, not divided into two dentate.

This new genus is allied to *Zubovskia* Dornar-Zapolskii, 1933 and *Anepipodisma* Huang, 1984. The main differences are listed in Table 1.

Table 1. Differences between *Pseudozubovskia* **gen. nov. and its allies.**

	<i>Zubovskia</i> Dornar-Zapolskii, 1933	<i>Pseudozubovskia</i> gen. nov.	<i>Anepipodisma</i> Huang, 1984
Anterior margin of vertex	Complete	Complete	Obviously with hollow
Posterior margin of pronotum	Complete or slight hollow	Complete and straight	With wide hollow
♀, apex of ovipositor	With two dentate	Not divided into two dentate	Not divided into two dentate

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Type species: *Pseudozuborskia xizangensis* **sp. nov.**

Etymology. The new genus name is derived from the Latin “pseud” and the allie genus “Zuborskia”.

***Pseudozubovskia xizangensis* sp. nov.** (Figs 1–5)

Male. Body medium size. Head big, shorter than pronotum, fastigium of vertex oblique forward, narrow, anterior margin complete; ocular distance equal to width of frontal ridge between antennae; frontal ridge oblique in profile, forming a round shape with vertex; lateral margin of frontal ridge contract at the joint with vertex, but gradually expended to almost paralleled downward, slight contract under median ocellus, with longitudinal groove under antennae; eyes ovate, longitudinal diameter 1.25 times as its horizontal diameter, 1.38 times as the length of subocular furrow; antennae filiform, reaching basal part of hind femur, with length 3 times as its width in the middle segments; pronotum almost cylindrical, anterior margin straight, slight hollow in the middle, posterior margin complete, almost straight; median carina slender, obviously severed by three transverse furrows, posterior transverse furrow located in the postmedian of pronotum, length of prozona 1.86 times as that of metazona; without lateral carina; length of lateral lobe of pronotum greater than its height, lower margin “s” shaped, anterior lower angle broad obtuse, posterior lower angle almost right angluar; prosternal spines slender, conical, apex sharp; length of mesosternal lobes almost equal to its width, minimum width of interspace of mesosternal lobes less than its length; lateral lobes of metasternum divided; without wings; hind femur slender, upper margin of median carina without fine denticulate, with length 5.5 times as it width; top of lower kneelobe rounded; outer side of hind tibia with 9 spines, inner side with 10 spines, without outer apical spines; length of first hind tarsus equal to that of the third, arolium large, surpassing the top of the claw; tympanum small, rounded; tergum of last abdominal segment of male with small long tapered furculae, length of furcula about 1/6 as that of anal plate; anal plate long triangular, lateral margin slight incurve at the basal part, with wide longitudinal groove in the middle; cercus slender, almost columnnar, apex rounded, incurve, surpassing top of anal plate, subgenital plate short conical.



Figs 1–5. *Pseudozubovskia xizangensis* **sp. nov.** 1. Body. 2. Head and pronotum. 3–5. Terminalia. 3–4. ♂. 5. ♀. 1, 4. Lateral view. 2–3, 5. Dorsal view. Scale bar = 1 mm.

Body brownish green; antennae brown, black after eyes; disc of pronotum brownish green, upper half of lateral lobes black, lower half yellowish brown, mesonotum, metanotum and terga of abdomen brownish green, with black streak at the side, propodium and mesopodium brownish green, hind femur orange red, black at the knee, hind tibia yellowish green, black in the basal part, spines on tibia black; hind tarsus yellowish green.

Female. Antennae stubby, with length 1.5–2.0 times as its width in the middle segments; longitudinal diameter of eyes 1.66 times as its horizontal diameter, 1.25 times as the length of subocular furrow; length of prozona of pronotum 1.86 times as that of metazona; minimum width of interspace mesosternal lobes slight greater than its length; lateral lobes of metasternum broadly divided; cercus columnar, apex sharp; anal plate long triangular, apex rounded; upper inner side of dorsal valves smooth, without fine denticulate, apex sharp; length of subgenital plate slight greater than its width, posterior margin triangular protuberant in the middle. With same colour as male.

Length of body: ♂ 17.0–20.0 mm, ♀ 17.0 mm; length of pronotum: ♂ 3.7–4.0 mm, ♀ 4.1 mm; length of hind femur: ♂ 10.0–11.0 mm, ♀ 11.0 mm.

Holotype ♂, China, Xizang, Bomi, 13 July 2008, collected by Guo-Dong Ren. Paratypes: 1♂, 1♀, same data as holotype.

Etymology. The new specific name is derived from the type locality “Xizang”.

***Eokingdonella gongbugyanda* sp. nov.** (Figs 6–11)

Male. Body small to median size; head big, shorter than pronotum, fastigium of vertex oblique forward, anterior margin obviously concave, lateral margin of vertex connect with lateral margin of frontal ridge, with obvious median carina, extended to occiput; frons oblique in profile, forming a round shape with vertex; frontal ridge broad and flat, only hollow at median ocellus, lateral margin almost paralleled, disappeared near clypeus; antennae filiform, not reaching posterior margin of pronotum, with length 2 times as its width in the middle segments; eyes ovate, longitudinal diameter 1.5 times as its horizontal diameter, 2 times as the length of subocular furrow; disc of pronotum flat, anterior margin straight, posterior margin almost straight, with slight hollow in the middle; median and lateral carinae obvious, severed by three transverse furrows, posterior transverse furrow located in the postmedian of pronotum, length of prozona 2 times as that of metazona; length of lateral lobe of pronotum greater than its height, anterior and posterior lower angle obtuse rounded; prosternal spine conical, apex obtuse rounded; length of mesosternal lobes greater than its width, width of interspace 2 times as its length; lateral lobes of metasternum divided; without wings; upper and lower margins of median carinae of hind femur smooth, with length 5 times as its width; top of lower kneelobe rounded; outer side of hind tibia with 6 spines, inner side with 8 spines, without outer apical spines; length of first hind tarsus almost equal to that of the third, arolium large, surpassing the top of the claw; tympanum small, but obvious; tergum of last abdominal segment with small rounded furculae; anal plate long triangular, apex sharp, lateral margin with a upward process in the middle; cercus conical, not reach the top of anal plate; subgenital plate short conical, apex rounded, not extended.

Body brownish green; antennae yellowish brown, black at the top segments; disc of pronotum brownish green, upper half of lateral lobes of pronotum black, lower half yellowish green, propodium yellowish brown, tibia and tarsus brownish red; mid femur brownish green; upper outer side of hind femur brownish green, inner side black, brownish red in the basal part, lower outer side black, basal half of inner side red, terminal half of inner side black; hind tibia black, light red brown at basal part; hind tarsus orange red; back of abdomen brownish green, with black broad band on the side; furcula black, lateral margin of anal plate black; back of thorax and abdomen yellowish brown.

Female. Body median, stubby; eyes ovate, longitudinal diameter 1.5 times as its horizontal diameter, equal to the length of subocular furrow; length of prozona 2.3 times as that of metazona; width of interspace of mesosternal lobes 1.12 times as that of interspace of metasternal lobes; width of mesosternal lobes 2 times as its length; anal plate triangular; cercus short conical; length of dorsal valves 2 times as its width, with sawtooth on its side; subgenital plate almost square, posterior margin triangular protuberant in the middle. With same colour as male, but sight deeper.

Length of body: ♂ 17.0 mm, ♀ 23.0–27.5 mm; length of pronotum: ♂ 3.5 mm, ♀ 4.5–4.6 mm; length of hind femur: ♂ 9.0 mm, ♀ 9.0–10.0 mm.

Holotype ♂, China, Xizang, Gongbugyanda, 19 July 2009, collected by Guo-Dong Ren. Paratypes 4♀, same data as holotype.

This new species is allied to *E. angqianensis* Chen *et* Zheng, 2009, the main differences are listed in Table 2.

Etymology. The new specific name is derived from the type locality “Gongbugyanda”.



Figs 6–11. *Eokingdonella gongbugyanda* **sp. nov.** 6. Body. 7. ♂, terminalia. 8. Head and pronotum. 9–11. ♀, terminalia. 6, 10. Lateral view. 7–8, 11. Dorsal view. 9. Ventral view. Scale bar = 1 mm.

Table 2. Differences between *E. gongbugyanda* sp.nov. and *E. angqianensis* Chen et Zheng, 2009.

	<i>E. angqianensis</i> Chen et Zheng, 2009	<i>E. gongbugyanda</i> sp. nov.
♂, length of prozona: length of metazona	2.6 times	2.0 times
Tympanum	Big	Small
Furcula	Triangular, same colour with abdomen	Rounded, black
Lower side of hind femur	Basal 2/3 red, terminal 1/3 black	Outer side black, basal half of inner side red, terminal half of inner side black
♀, width of interspace mesosternal lobes: width of interspace metasternal lobes	1.40 times	1.12 times

***Dysanema magna* sp. nov.** (Figs 12–15)

Female. Body medium size; head big, longer than pronotum, vertex wide, anterior margin arc protruded, with median carina; ocular distance 1.66 times as width of frontal ridge between antennae, equal to longitudinal diameter of eyes; foveola rectangular, with length 3 times as its width; front slight oblique in profile, frontal ridge wide, lateral margin slightly hollow at median ocellus, with broad shallow groove; lateral carinae of front straight; antennae filiform, stubby, not reaching posterior margin of pronotum, with length 1.5 times as its width in middle segments; eyes rounded triangular, longitudinal diameter 1.53 times as its horizontal diameter, equal to length of subocular furrow; pronotum wide and short, anterior margin straight, slightly concave in the middle, posterior margin with a wide hollow; median and lateral carinae obvious, but not severed by transverse furrows, posterior transverse furrow located in the postmedian of pronotum, length of prozona 2 times as that of metazona; height of lateral lobe of pronotum greater than its length, anterior and posterior margin almost parallel, anterior lower angle obtuse, posterior lower angle rounded; mesonotum and metanotum with median carina, without lateral carina; width of mesosternal lobes greater than its length, width of interspace of mesosternal lobes 2 times as its length; lateral lobes of metasternum divided; without wings; length of hind femur 4 times as its width, median carinae on upper and lower margins smooth, top of kneelobe rounded; outer side of hind tibia with 10 spines, inner side with 10 spines, without outer apical spines; arolium small, not reaching half length of claw; terga of abdomen with median carina, without lateral carina; without tympanum; anal plate scutiform; cercus short conical; ovipositor stubby, outer margin smooth. length of subgenital plate greater than its width, posterior margin straight, slightly concave in the middle; ventral basal valvular plate wide and short, with fine puncta.

Body yellowish brown; inside of lateral carinae of pronotum with black longitudinal bands; lateral lobes dark brown in the middle, with a white twill tape; both side of mesonotum, metanotum and tergum of abdomen with a black longitudinal stripe, and with a pair of splayed yellowish brown twill tapes on each black stripe; hind tibia reddish brown, top of ovipositor black.

Length of body: ♀ 29 mm; length of pronotum: ♀ 3 mm; length of hind femur: ♀ 11 mm.

Holotype ♀, China, Xizang, Dingri, 26 July 2005, collected by Ai-Min Shi.

This new species is allied to *D. irvinei* Uvorov, the main differences are listed in Table 3.

Etymology. The new specific name is derived from the Latin “*magna*”.

Table 3. Differences between *D. magna* sp. nov. and *D. irvinei*.

	<i>D. irvinei</i>	<i>D. magna</i> sp. nov.
Body size	Small and oblate, length of body 17 mm (♀)	Big, not oblate, length of body 29 mm (♀)
Foveola	Not obvious	Obvious, length 3 times as its width
Frontal ridge	Broad, flat	With broad shallow longitudinal groove
Median ocellus	Degenerated	Obvious
Ocular distance	Slightly weaker than longitudinal diameter of eyes	Equal to longitudinal diameter of eyes
Pronotum	Without transverse furrows	With obvious transverse furrows
Mesonotum, metanotum and tergum of abdomen	With lateral carinae	Without lateral carinae



Figs 12–15. *Dysanema magna* **sp. nov.** 12. Body. 13. Head and pronotum. 14–15. ♀, terminalia. 12. Lateral view. 13–14. Dorsal view. 15. Ventral view. Scale bar = 1 mm.

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